

ACCELERATING DIGITALIZATION FOR IMPROVED PUBLIC SERVICE DELIVERY AND FINANCIAL INCLUSION IN SIERRA LEONE¹

This paper takes stock of digitalization in Sierra Leone and identifies several factors requiring attention to accelerate digitalization. These factors range from relatively higher cost of the internet, low quality of service, legal and regulatory challenges, low private sector participation, lack of adequate IT skills, and lack of supportive infrastructure gaps. Notwithstanding some challenges, it finds that adoption of digitalization has picked-up in government operations, providing a solid platform for efficient, transparent and effective PFM and improved service delivery in priority sectors such as health, education and agriculture. A wider adoption of Digital Financial Services (DFS) could increase the ease and speed of payments as well as enhancing financial inclusion in Sierra Leone.

A. Motivation

1. **The COVID-19 pandemic has forced firms and governments globally to adapt their processes, accelerating the pace of digitalization.** The rapid switch to working from home has permanently altered where and how employees execute their tasks in many countries, including Sierra Leone. Even before COVID-19, Sierra Leone was among the first countries to deploy mobile technology during the Ebola Epidemic in tracking, monitoring and managing infections, as well as providing cash assistance to support livelihoods. COVID-19 has further accelerated digitalization including use of mobile apps to trace, monitor, and manage the outbreak. This has helped to provide more resilience and allowed for a rapid and flexible response to pandemic.²
2. **In this paper we ask, how can Sierra Leone build on this momentum to enhance digitalization and improve public service delivery?** Digitalization is creating new opportunities for improved public service delivery and strengthened public financial management systems in Sierra Leone. Digital provision of government services enables inclusion for the previously unserved. To digitally administer taxes, file, and make payments reduces the cost of compliance and save on time, while reducing face to face contact with tax officials, thereby minimizing risks of rent-seeking behavior. With continued adoption, addressing the challenges of leaving no one behind is central, such that all citizens benefit from digitalization. This would in turn require continued investment into the government's human capital development agenda and skills. Sierra Leone has also made good progress in extending IT systems to support budget execution, targeting of subsidies, and payments for government and utility services (water and electricity).
3. **To digitally administer taxes and payments of government services, Sierra Leoneans will need access to bank accounts and the digital world.** Access to digital financial services (DFS)

¹ Prepared by Michael Saffa, Peter Wankuru, Rosalind Mowatt, Saanya Jain (all AFR). We are extremely grateful to comments and guidance provided by Sukhwinder Singh (MC) and Veronica Trujillo (World Bank).

² See IMF, Regional Economic Outlook (REO) on digitalization in Sub-Saharan Africa, Spring 2020.

enables people and businesses to complete economic transactions in an efficient manner and promote financial inclusion. Sierra Leone has made steady progress in advancing financial inclusion. The percentage of the adult population with an account at a financial institution or mobile money provider has increased from about 20 percent in 2017 to about 24 percent in 2019. The percentage of adults with an account at a formal financial institution is much lower (12 percent in 2017, the latest year available). Women and people in rural areas continue to lag in terms of financial access. Given the business models and lack of geographic reach of the banking system, DFS offer significant opportunities for increasing financial inclusion.

4. The rest of this paper is organized as follows: Section B highlights on the pace of digitalization in Sierra Leone and constraining factors. Section C covers tangible examples of how authorities in Sierra Leone are leveraging digitalization to strengthen PFM (expenditure controls, targeting subsidies, and revenue mobilization) and to improve public service delivery in key sectors. Section D provides the recent developments on the DFS front and existing potential, while section E concludes with policy discussions.

B. The Pace of Digitalization and Remaining Gaps

5. The rate of connectivity and integration of digital technology into everyday life amongst Sierra Leoneans is expanding. Internet penetration increased from about 13 percent in 2014 to about 27 percent of total population in 2019 (GSMA, 2020) and is estimated to have reached 30 percent in 2021 (Figure 3). The latest data shows Sierra Leone's continued expansion in the number of internet users (2.4 million persons in 2021), the number of persons using social media platforms (850,000 people), and the number of mobile connections (100 percent of the population) and increasing number of secure internet servers per one million persons (Figure 1). The adoption rates of digital financial services (henceforth DFS) is estimated at 30 percent of adult population in 2019 (UNCDF, 2021). Sierra Leone has one of the fastest growing technology adoption trends in DFS, expanding from about 9 percent of adults using a DFS account in 2017 to about 30 percent in 2019.

6. The government of Sierra Leone has underscored the importance of digitalization to its development strategy. Sierra Leone was one of the first countries in West Africa to set out a "Mobile First" digital strategy in 2019. Digitalization is core to the government's development strategy, with a clear path laid out in its ICT development strategy (2019-2029) for an inclusive digital ecosystem. The strategy has three pillars: digital identity, digital economy, and digital governance (DSTI). Priority projects includes the ease of doing business, education data hub, integrated geographic information system, financial data mapping, GoSL appointment app, and environment. The government is advancing legal and regulatory reforms, including enacting the Cyber Security and Crime Act in 2021 to create a thriving environment for digitalization. It is also prioritizing infrastructure investments, including the rollout of the fibre optic cable, which is expected to increase access to internet connectivity, and raise quality and speed. Sierra Leone is also tapping into innovative global initiatives with development partners. In 2021, Sierra Leone joined Giga, an initiative with the International Telecommunication Union (ITU) and UNICEF to connect approximately 10,387 schools in the country to the internet. This initiative will eventually reach over

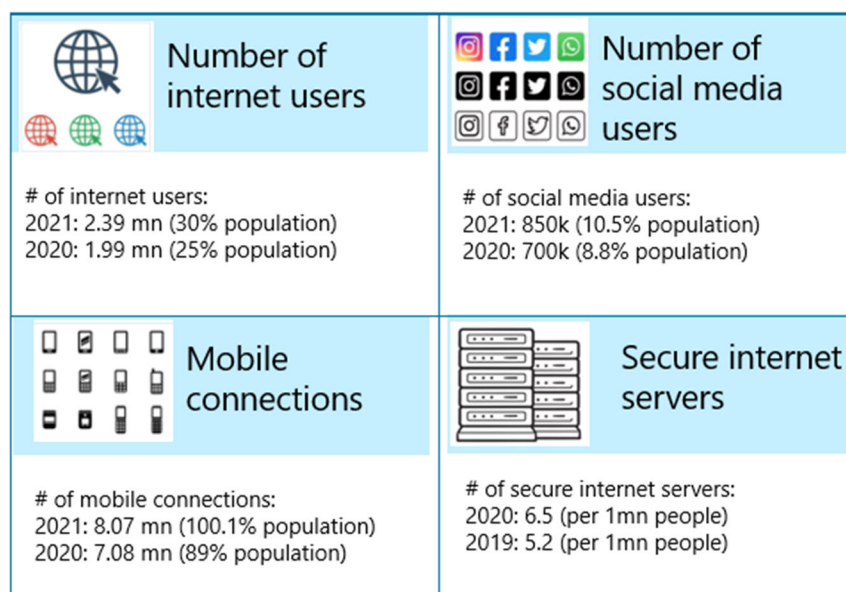
3 million people around the schools in addition to the students (Giga, 2021).

7. While Sierra Leone has made great strides with its digitalization strategy, several barriers limit the pace of progress.

Coverage is limited, with 15 percent of the population having no mobile phone signal. Affordability and quality of service remains relatively poor. Although 60 percent of the country has at least a 3G

network coverage, only 20 percent have active mobile broadband subscriptions (ITU, 2020). One GB of internet data costs US\$3.26 in 2021, which ranks Sierra Leone 152nd out of 230 countries for cost of mobile data (Figure 2). In addition, network quality is relatively weak, with Sierra Leone ranking 168 out of 173 countries for quality and speed (Speedtest, 2021).

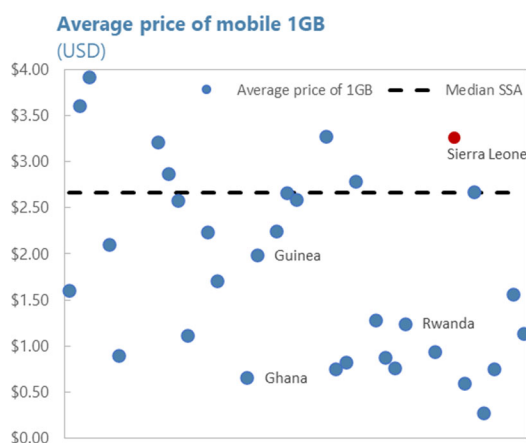
Figure 1. Recent Trends in Digital Adoption in Sierra Leone



Source: DataReportal – Global Digital Insights; WDI

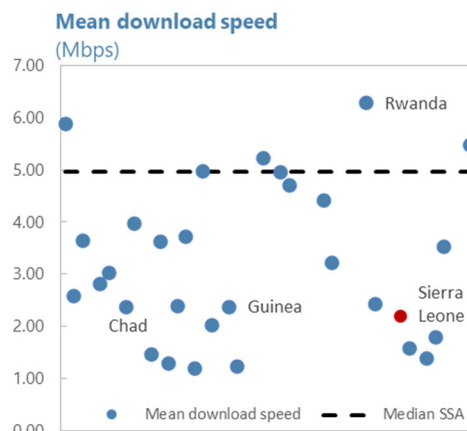
Figure 2. Accessibility and Quality of Mobile Internet

The cost of 1GB of data in 2021 is above the SSA median...



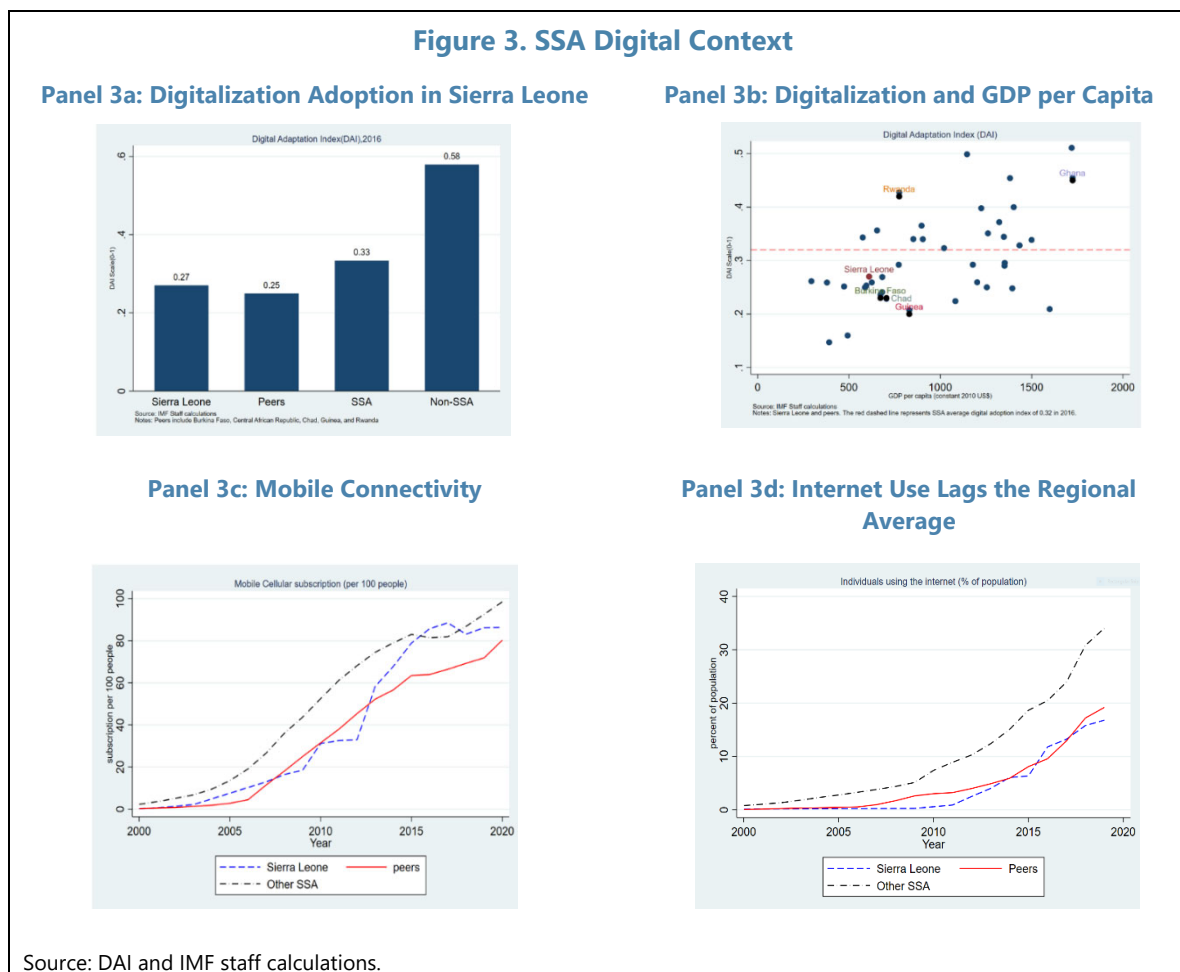
Source: Cable.co.uk, 2021.

while download speeds lag significantly behind the median.



9. There is room for continued progress in digital adoption measured more broadly.

Sierra Leone ranks low compared to her peers in various digital adoption measures: digital adoption index (DAI), internet use, and mobile connectivity.³ On a scale of 0-1, Sierra Leone lags the SSA average on digital adoption (Panel 3a). This is the case even after controlling for per capita GDP (Panel 3b). Mobile connectivity is broadly in line with the regional average (Panel 3c) but below the regional average in terms of individuals' use the internet (Panel 3d). These broad measures suggest scope for further improvement in digital adoption across different user groups in order to reap the maximum gains that comes with technology adoption.

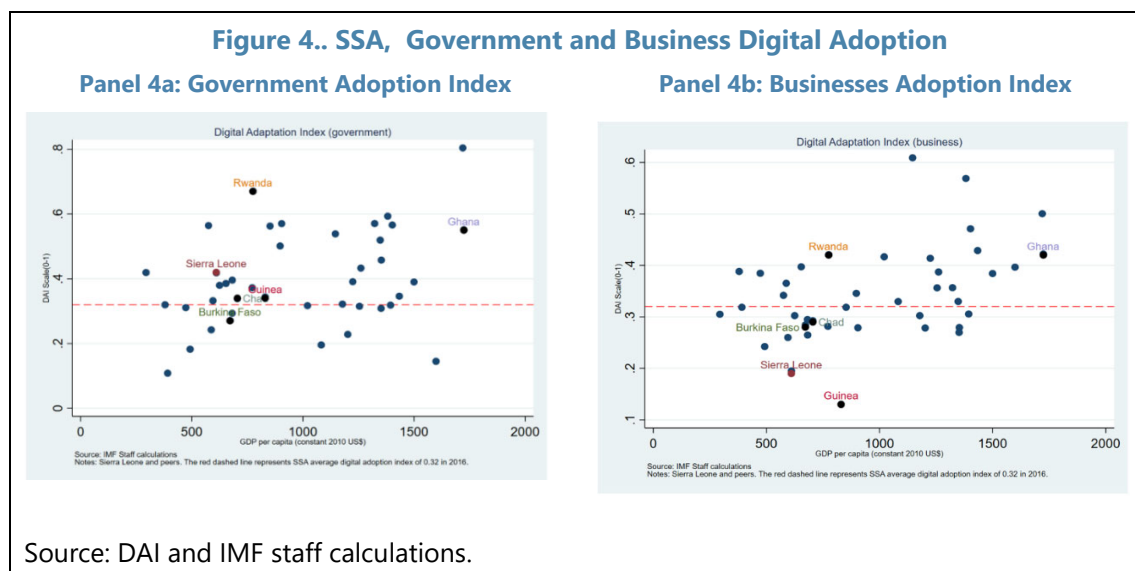


10. Internet connectivity is particularly low amongst businesses, although this is not unique to Sierra Leone.

There is a gap in digital adoption between the public and private sector (Figure 4). Yet, to fully realize the benefit of digitalization, both public and private sector must get connected. Beyond the DAI, Sierra Leone ranks 126 out of 137 on firm-level technology absorption (WEF Global Competitive Report 2017-18). The private sector has raised several challenges that constrain adoption of digitalization in Sierra Leone. These includes the lack of supportive policy and

³ The DAI measures countries digital adoption across people, government, and business ([Digital Adoption Index - worldbank.org](https://www.worldbank.org))

legal environment (i.e. intellectual property rights), limited access to finance, insufficient electricity connectivity, and limited e-business skills (World Bank, 2020). Addressing legal and regulatory reforms will further improve private sector participation in the digital space, reduce cybercrime, expand access, and reduce the cost of internet connectivity. Initiatives such as the recent unbundling of SALCAB to a private sector entity (Zoodlabs) is expected to increase operational efficiency, improve wireless access and reduce the cost of internet connectivity for the private sector.

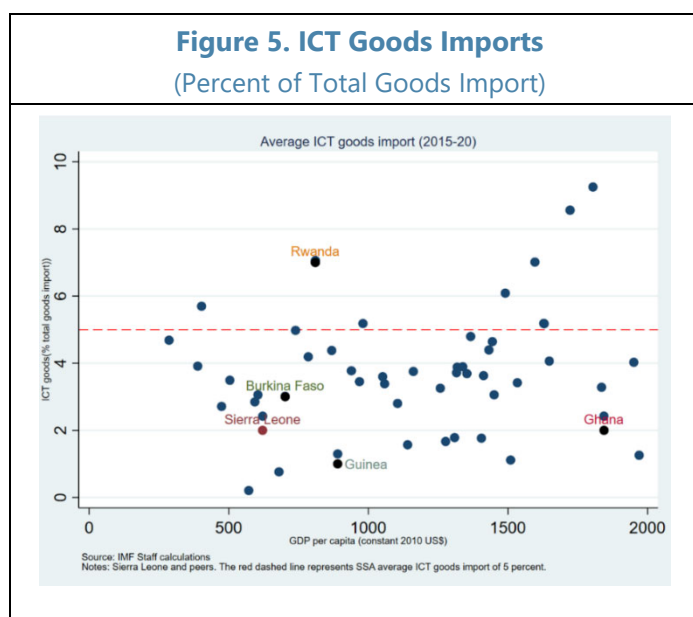


10. Access to IT equipment and related accessories is also low, yet these provides the hardware for digitalization.

Importation of IT equipment is a proxy for technology adoption amongst a country's private sector. Figure 5 plots the percent of IT equipment imported as a ratio of total goods imports and also controls for the per capita income. In Sierra Leone, over the period 2015-20, this stood at about 2 percent compared to the regional average of about 5 percent.

Nonetheless, there are concerns for measurement errors and the scope for definition of classes of IT products, which might understate

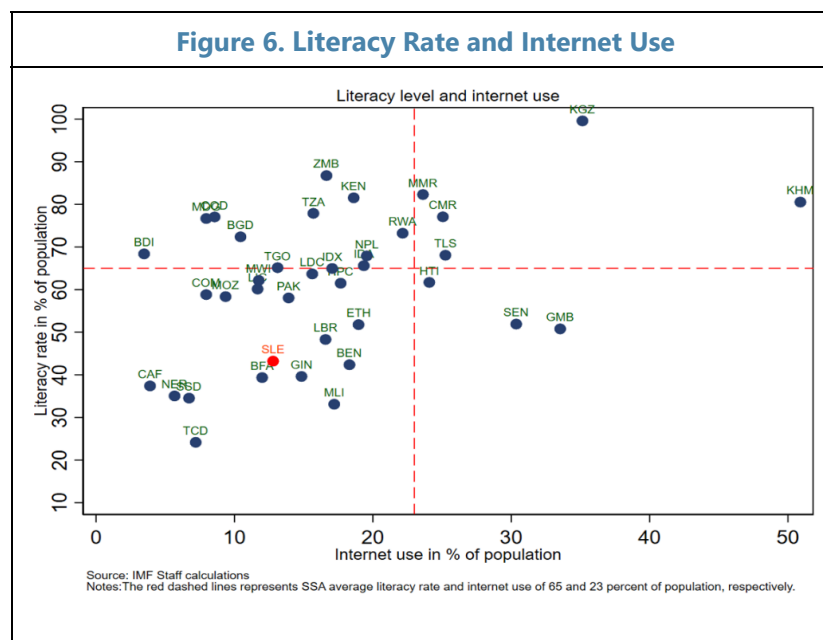
this for Sierra Leone while overstating it for other countries, including for peers at the same level of income per capita. As such, these comparative analyses should be interpreted cautiously.



11. Increasing literacy level and skills development are core foundations for digitalization.

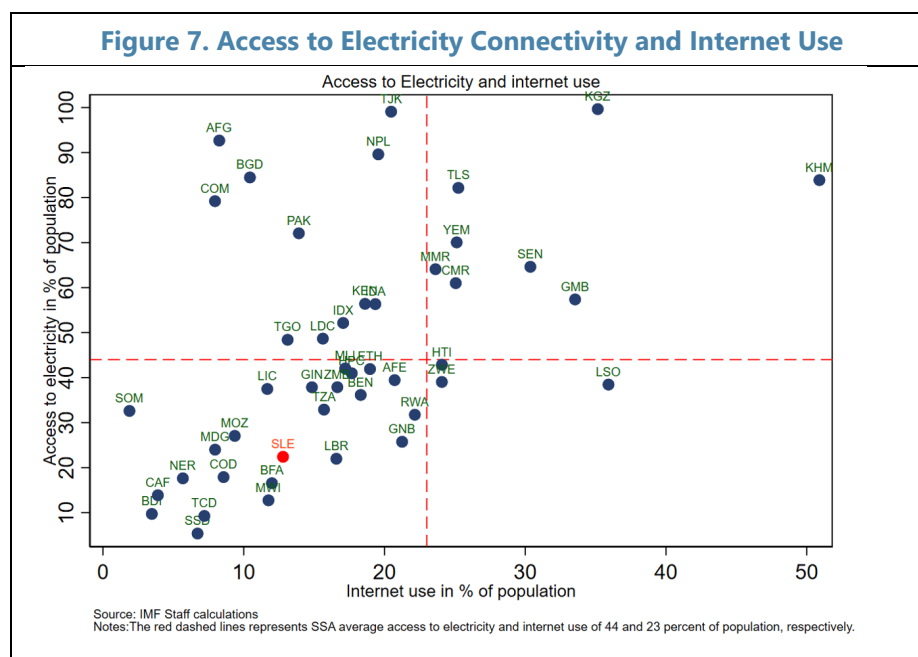
To benefit from digitalization will require continued investment in human capital developments.

Sierra Leone lags in both the average literacy rate and internet penetration compared to the regional average (Figure 6). The average literacy rate in SSA is about 65 percent (over 2015-20), while the countries that have made impressive gains are those that have laid foundations for continued learning as well as investment in digital skills. Education will need to integrate information technology into student's learning, while still young. In addition, creating a conducive business environment and basic social amenities, are also key in attracting and retaining technical IT skills.



12. Reliable electricity connectivity and increased power supply could enhance digitalization.

Unreliable electricity supply is one of the key impediments to digitalization in Sierra Leone (Figure 7). The country's installed power capacity as of 2018 is about 105 MW for a population of over 7 million. Sierra Leone is in the lower left quadrant,



indicating that lower access to electricity is also associated with lower access to the internet use. Plugging this gap is critical to fully benefit from digitalization and accelerate the growth of the sector.

C. Digital Technologies and Public Service Delivery

13. The government of Sierra Leone is extending digital technologies in support of its public financial management reforms (PFM) and improved service delivery. It has expanded the coverage of the Integrated Financial Management Information System (IFMIS) to approximately 61 ministries, departments, and agencies, from about 30 in 2020.⁴ The system is being upgraded to a web-based version and will be connected to the T24 system at the Bank of Sierra Leone to allow electronic files to be transmitted from IFMIS to the Bank of Sierra Leone. This is expected to replace the manual system of issuance of checks, shortening the processing time and helping to strengthen cash management and planning.

14. Use of digital technology is expected to help improve spending efficiency and targeting of priority spending. Wage and salary management has improved through the use of biometric vetting of government employees, helping to reduce ghost worker problems. In education, teacher assignments are being managed through an automated digital system which assigns teachers and evaluates student progress. There is scope to further scale-up these applications to monitor both teacher and health workers' absenteeism. In agriculture, the authorities are providing small holder farmers with an e-voucher based subsidy for acquiring farm inputs such as seeds, fertilizers, tractor services, and chemicals.⁵ Arising from the Ebola crisis, the use of mobile phones to make salary payments to healthcare workers and targeting of cash assistance has been very effective. Mobile technology has also been widely used during the COVID-19 outbreak to monitor, track and manage infections. In 2019, the government of Sierra Leone and UNICEF launched the Drone Corridor to deliver medical supplies to health centres in rural communities. Further in 2021, the Directorate of Science and Technology (DST) in collaboration with UAVaid (a UK based drone specialist) and with support from the Bill and Melinda Gates Foundation launched a medical drone delivery service (MDDS) for delivery of medicines in remote parts of Sierra Leone thereby overcoming numerous transport challenges to access rural community health centres and hospitals.

15. Publishing contracts online has improved transparency of spending. Sierra Leone has continued with the practice of publishing unaudited financial statements for its emergency financing response⁶ and key details of large procurement contracts related to crisis mitigation. They are also reporting on their broader social and economic response.⁷ The National Public Procurement Authority (NPPA) launched the electronic procurement system in March 2021 that will improve efficiency, mitigate corruption, transparency and accountability in procurement processing at public institutions. The publication of procurement and tender award information on the NPPA website is expected to bolster transparency and accountability in public spending. The Ministry of Finance is

⁴ AFRW02 TA report on strengthening Budget Execution systems, July 2021.

⁵ There are typically three channels via which digitization can help improve with targeting anti-poverty programs: (i) ease of paying cash; (ii) biometric identification; and (iii) keeping track of payments in government accounts.

⁶ [FINAL-Q1-Report-NACOVERC-UNAUDITED-FINANCIAL-REPORT-Q1-2021.pdf \(mof.gov.sl\)](https://mof.gov.sl/FINAL-Q1-Report-NACOVERC-UNAUDITED-FINANCIAL-REPORT-Q1-2021.pdf)

⁷ [UPDATED-FY-2020-QAERP-TABLES.xlsx \(live.com\)](https://live.com/UPDATED-FY-2020-QAERP-TABLES.xlsx)

rolling out an electronic contract profiling system (ECOPS) that will track all outstanding payments for contracts and capture upcoming procurement expenditure from planning to payment stage. This is expected to improve the efficiency and transparency of public procurement transactions.

16. The National Revenue Authority (NRA) is making use of information technology to strengthen its tax administration and minimize risks for rent-seeking. A new web-based Integrated Tax Administration System (ITAS) has been developed and is under implementation. The system digitalizes taxpayer registration, returns filing, payment of taxes, compliance management and other domestic tax management functions. This is expected to reduce costs for compliance amongst taxpayers and lower administration costs for the NRA. This also has the potential to improve on governance and reducing corruption. For example, if tax filing is digital, it reduces the need for face-to-face engagement between tax official and taxpayer, minimizing opportunity for rent seeking behavior (Gupta et al. 2017). The integration of ITAS with third-party data is expected to provide adequate data and information to help monitor tax compliance. Its interface with the Automated System for Customs Data (ASYCUDA) World will enable both Customs and domestic tax department (DTD) to share information relating to importer Tax Identifier Number (TINs), import GST declarations and withholding income tax paid at customs, thus making taxpayer profiling, assessment and reconciliation easier and faster.

17. The Freetown City Council (FCC) is leveraging digitalization to boost revenue collection from property levies, providing a best practice on property taxation in the region. Revenue collection has been central to the current Mayor's Transform Freetown agenda.⁸ With the support of International Growth Centre and International Centre for Tax and Development, FCC has developed a new IT system that leverages satellite imaging to manage property taxation from data collection, valuation, billing, payments, appeals, all the way to enforcement. The results have been a resounding success with revenue increasing 10-fold from about Le 7 billion in 2019, enabling the city budget to be self-sufficient and boosting service delivery. This innovative use of digital technology will serve as a best practice for other countries in SSA on taxation of property and real-estate.

18. To summarize, this section provides tangible examples of how authorities in Sierra Leone are making use of digital technology to enhance public financial management (expenditure and cash management controls, targeting of subsidies) and enhanced revenue mobilization. Within the health sector, the use of the mobile and drone technology is helping reach the previously excluded population, while in agriculture use of e-vouchers ensures that input subsidy is well targeted. These aspects indicate numerous opportunities for applying digital technology to improve the allocation of scarce public resources to provide public service delivery.

D. Digitalization and Financial Inclusion in Sierra Leone

19. Traditional banking services are challenging to access for ordinary Sierra Leoneans. Sierra Leone has made slight progress in advancing financial inclusion but access to finance remains

⁸ <https://www.theigc.org/wp-content/uploads/2019/11/Grieco-et-al-Policy-Brief-2019.pdf>

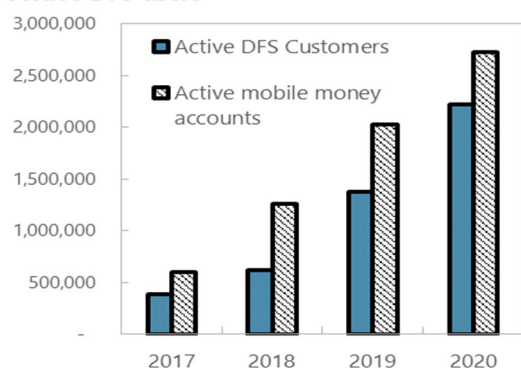
low—less than the Sub-Saharan Africa average. The percentage of the adult population with an account at a financial institution or mobile money provider has increased to 24 percent in 2019 from 20 percent in 2017 (Figure 8). The percentage of adults with an account at a formal financial institution is much lower (12 percent in 2017, the latest year available). Women and people in rural areas continue to lag behind in terms of financial access. Given the business models and lack of geographic reach of the banking system, Digital Financial Services (DFS) offer significant opportunities for increasing financial inclusion. DFS can provide households with convenient payment and withdrawal channels as well as savings and borrowing channels that improve economic activities and can spur growth, entrepreneurship, and reduce poverty.

Figure 8. Financial Inclusion (2011-2021) 1/

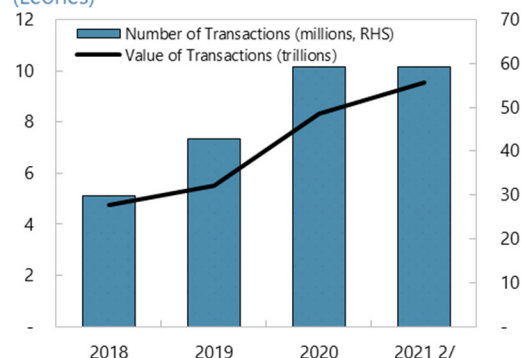
DFS users grew at an average of 82 percent every year, thanks in part to growth in mobile money...

which has grown both in number and value of transactions.

Active DFS users



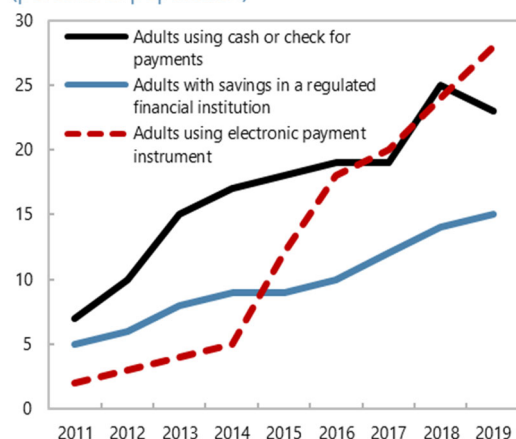
Mobile Money Volume and Value of Transactions (Leones)



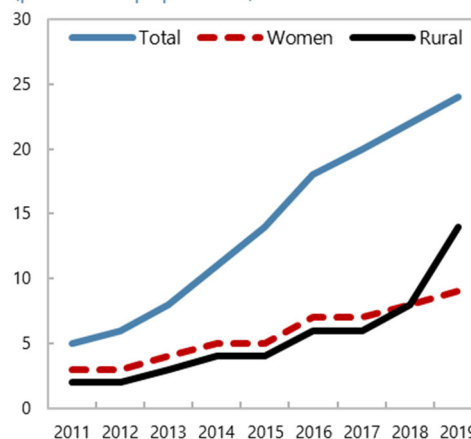
Electronic payment has surpassed usage of traditional financial institutions and cash and check payments...

but women and rural residents lag behind.

Access to financial services (percent of population)



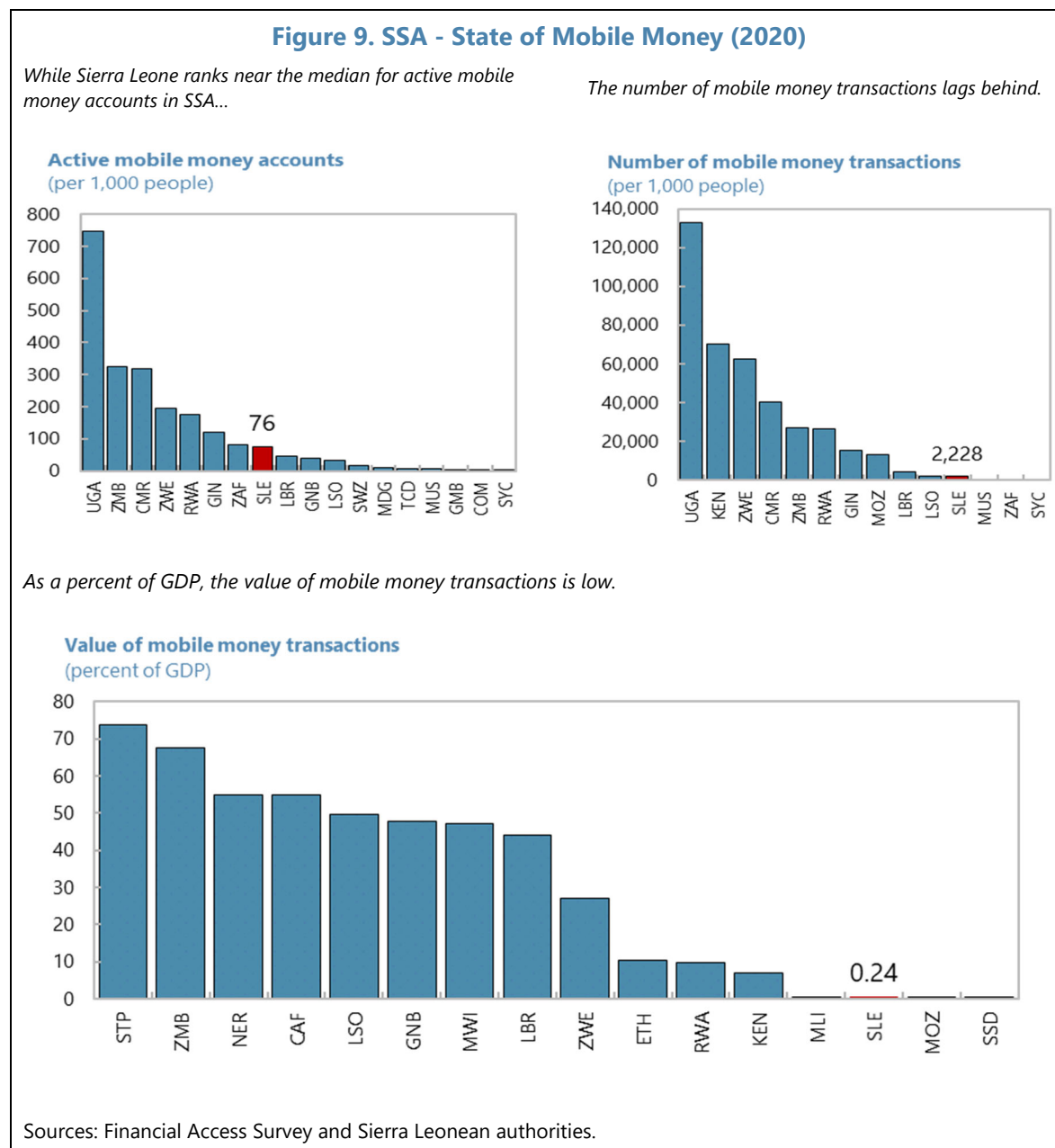
Adults with savings accounts (percent of population)



1/ Source: BSL; staff calculations.

2/ Data is through September 2021.

20. Mobile money operators (MNOs) have so far been the main drivers of financial inclusion in Sierra Leone. Sierra Leone currently has three MNOs with about 35,000 agents in operation. Since Covid-19, the value of transactions has grown by 73.8 percent in September 2021 to Le 9.6 trillion from Le 5.5 trillion in 2019. Although the number of registered customer accounts fell in 2020 (to 4.7 million down from 6.2 million in 2019) due to a clean-up of accounts, the number of active users increased (2.2 million vs. 1.4 million), which indicates improved usage of DFS during the Covid-19 pandemic. The volume and value of transaction of DFS also accelerated in 2020 amidst Covid-19 lockdown and restrictions and has been sustained in 2021 (Figure 9).



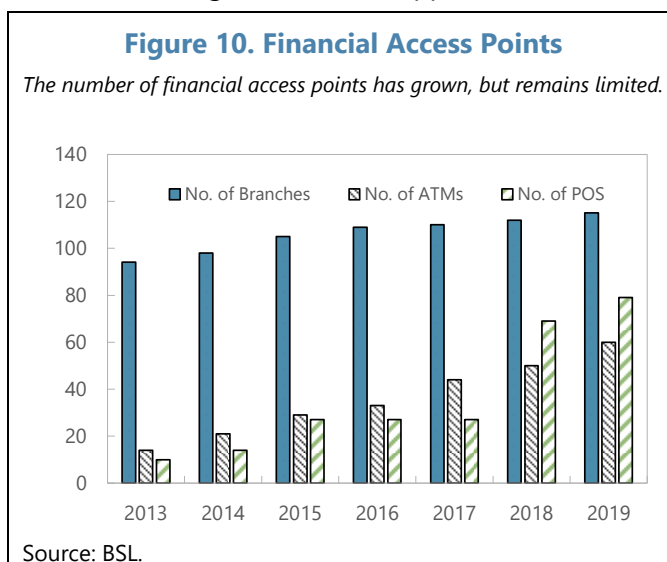
21. The most popular services offered by MNOs are cash-in, cash-out and domestic peer-to-peer transfers. However, DFS could also be used effectively for bill payments, international remittances, and government payments, among other use cases. The 2021 FSSR recommends providing incentives to encourage providers and customers to broaden their service offers and usage. Further, digitalization can also promote access to credit. In Sierra Leone, bank lending is typically highly concentrated in certain businesses (notably trade finance and construction) and access to credit is highly constrained.⁹ However, in 2020 only 0.2 percent of total DFS transaction volumes were for digital loans in Sierra Leone (UNCDF, 2021).

22. Commercial banks are taking advantage of digitalization to expand their customer base. Banks are expanding ATM access points, internet banking, mobile bank applications and USSD¹⁰ to grow their customer base and complement the traditional brick and mortar banking services (Figure 10). Microfinance institutions are also beginning to roll out some digital services (UNCDF, 2021).

23. The impact of digitalization on financial inclusion may have implications for monetary policy. As noted in IMF (2021), central banks that target reserve money, as Sierra Leone does, may have more challenges in forecasting velocity due to changing financial inclusion and depth.

There has been some speculation, for example, that the rapid growth in DFS in 2020 was partly responsible for the unusually high demand for cash that year, which in turn created shortages of local currency. If digitalization enhances access to credit, that may also affect the monetary policy transmission mechanism. Central banks are therefore advised to keep a close eye on developments with e-money.

24. Upgraded and interoperable payments systems are expected to promote efficiency and financial inclusion. Payment systems promote financial stability by reducing systemic and settlement risks. These systems also facilitate financial inclusion by allowing the population (including the unbanked) to make and receive payments in a cost-efficient way. By 2013, Sierra Leone had introduced various electronic systems to facilitate bank-intermediated payments, including Real-Time Gross Settlement (RTGS), used primarily for large-value transactions, and



⁹ According to the BSL, in 2019, only 14 percent of adults (and 4 percent of women) had credit from a regulated financial institution, while 31 percent of SMEs had a loan or line of credit.

¹⁰ Unstructured Supplementary Service Data (USSD) is a communications protocol used in mobile networks for sending short text messages. It allows customers with mobile phones to access basic financial services (UNCDF, 2021).

Automated Clearing House (ACH), used mainly for retail transactions. According to the BSL, the ACH has reduced settlement times substantially, from T+9 to T+1. Nevertheless, most commercial banks, as well as the BSL still do not provide complete straight-through-processing (STP) of transactions. Introducing STP would increase efficiency and reduce operational risk in the financial sector. Another important area of progress is the National Payments Switch, which allows for interoperability of payment platforms (including MNOs, but excluding other non-bank financial institutions), and which is due to come into operation before the end of 2022. Interoperability can promote competition in the financial sector, reduce fixed costs and enable economies of scale in making payment services more convenient and accessible (Cirasino et al, 2016).

25. The Bank of Sierra Leone introduced a regulatory sandbox for fintech startups in 2017 to encourage innovation and competition in the digital financial space. The regulatory sandbox is supported by the United Nations Capital Development Fund (UNCDF) and incorporates technology in the financial space to improve access to the unbanked population. The fintech window created an opportunity for startups, banks and entrepreneurs to create digital financial solutions whose viability can be tested in a secured space to reduce any potential risk before they are licensed to operate in the financial system. In May 2018, four businesses were selected to enter the regulatory sandbox of which two were granted licenses to operate (Mikashboks and InvestEd) after assessment of the products by sandbox regulators. As of February 2022, fifteen sets of fintech products are in the sandbox, with five having been granted licenses to test their product in the financial system (Afro Mobile Money, Soft Pay, Pay Online, B 'N' B Cash and Stochastic). However, regulatory sandboxes have tended to work better in markets where there is already a flourishing fintech ecosystem, and scarce regulatory resources may be better channeled elsewhere.

26. Digital financial services and payments systems also create new regulatory challenges and risks. The new National Payment Systems Act (NPSA, currently in Parliament), guidelines for mobile money, remittances regulations and agent banking guidelines are a few of the areas where the authorities are working to improve the legal and regulatory environment for digital financial services. The new NPSA will give the BSL the power to regulate and oversee the National Payment System as a whole, including MNOs.

27. For digital money to be adopted widely and promote financial inclusion, it must remain trustworthy. For many customers, their first experience of accessing financial services is through mobile money. A large portion of consumers may be unsophisticated and so are more vulnerable to financial losses, including from agent fraud. The regulatory and supervisory framework of DFS should also support financial integrity and safeguarding of data, including preventing digital money from becoming a safe haven for criminal activity. Cybercrime is a growing problem in developing countries where sufficient safeguards may not be in place to ensure the security of transactions conducted via mobile phone (FSSR, 2021). There are also various risks related to the safekeeping of customer funds, relating to where and how customer funds are invested. In Sierra Leone's case, although the value of transactions and e-money deposits are relatively small compared with those of commercial banks, the rapid growth in the number of transactions and the high number of active accounts highlights the urgency of ensuring adequate supervision and

regulation of the sector. The recent enactment of the guidelines for mobile money and agents network guidelines are therefore welcome developments, although gaps remain in terms of regulation for data management and data protection, and consumer protection. The BSL also needs to ensure that sufficient regulatory capacity is in place and there is adequate understanding on the part of the regulators of where the risks might lie.

28. Microfinance institutions have partnered with MNOs to introduce digital credit products. The introduction of loan products via Orange Money (Lajor Loan) and AfriMoney (Africredit) enable customers to secure credit on their mobile money platforms. Regulatory reforms, including a more tailored regulatory regime for the microfinance sector as well as more data collection on the activities of microfinance institutions, are needed to increase the supply and uptake of such services.

29. Quality collateral often restricts access to credit but the BSL's Collateral Registry and the MNO's Mobile Credit, should improve access to finance. The Bank of Sierra Leone launched a web-based Collateral Registry in June 2017 to improve access to finance for Micro, Small and Medium Enterprises (MSMEs). The scope of the registry has recently been broadened to include registration of immovable assets in addition to movable assets while also enabling non-incorporated entities not registered by BSL to register security interest. This should make it easier for individuals and SMEs to secure loans with collateral such as inventories, farm products, timber, consumer goods, receivables, movable assets (including vehicles), machineries and immovable assets (land and buildings). However, this innovation needs to be complemented by reforms to commercial court processes.

30. There remains scope for the BSL to improve the credit infrastructure services it offers through enhanced digitalization. For example, there are delays in obtaining credit reports from the Credit Reference Bureau, housed at the BSL, which is reliant on a database in Excel and requires reports to be manually produced.

E. Conclusion and Policy Discussions

31. This paper takes stock of digitalization in Sierra Leone and identifies several factors limiting progress. These factors range from prohibitive cost of internet, low quality, legal and regulatory challenges, low private sector participation, lack of adequate IT skills, and supportive infrastructure gaps (fibre optic cable and electricity connectivity). However, adoption of digitalization has picked-up in government's operation, providing a solid platform for efficient, transparent and effective PFM and improved service delivery in priority sectors such as health, education and agriculture and enhanced revenue mobilization. Within the health sector, the use of the mobile and drone technology is helping reach the previously excluded population, while in agriculture use of e-vouchers ensures that input subsidy is well targeted. These aspects indicate numerous opportunities for applying digital technology to maximize on available scarce public resources to provide public service delivery.

32. Reforms to the payments systems is ongoing to support digital payments and promote financial inclusion, while the BSL has launched an incubation (sandbox) for developing digital financial inclusion products. Nonetheless, there is need to incentivize private sector digital adoption including by improving regulatory and legal environment, increasing access to electricity, finance and build capacity to minimize risks to cybercrime and data protection. The following specific recommendations emerge from the analysis:

- **Investment in key infrastructure and complementary social amenities:** The government's pursuit of universal access to electricity at affordable prices remains noble and doing this would enable broader access to connectivity and digitalization. In addition, accelerating completion of laying of the fibre optic cable could substantially cut the cost of internet and raise connectivity speed. Complementary foundational infrastructure such as roads, water, and housing would position Sierra Leone as an investment destination, attracting and retaining needed technology and IT skills.
- **Investment in human capital:** With only about 1.5 percent of approximately 10,387 schools connected to the internet, fast-tracking connectivity for education institutions should be a priority. Building people skills is critical to reap the benefit of emerging digital opportunities in government service provision. However, given that Sierra Leone is starting from a very low base, there would be need to prioritize public secondary schools and technical/vocational institutes. Furthermore, over the medium to long-term, the entire education curriculum will need to integrate information technology into student's learning right from elementary to tertiary level.
- **Recalibrate the policy, legal and regulatory environment to enable and facilitate digitalization.** The private sector cites the lack of an enabling policy and regulatory regime to support adoption of digitalization (i.e. the lack of supportive intellectual property rights). A review of legislation is also needed to strengthen measures to limit cyber-attacks and crimes as well as data protection. Review the regulatory regime to ensure a well-regulated sector that caters for competitive pricing, cyber security, data protection, and business continuity.
- **Build e-business skills, including by enabling public sector workers digital skills and garnering support for behavior change.** Automation of public service delivery and strengthening PFM controls will need to be complemented by critical staff ethics and support for change and adoption of digitalization. This is important to avoid exemptions and unchecking of inbuilt systems controls and desire to revert to manual business processes. Complementary capacity building to instill e-business skills across all public servants would also empower them and uphold systems' integrity.

33. A wider adoption of DFS would increase the ease and speed of payments as well as enhancing financial inclusion. However, due consideration also needs to be given to the regulation of these financial services.

- **Improve data collection on DFS and make data publicly available.** As noted in the BSL's new Financial Inclusion Strategy, one of the challenges faced under the previous strategy was

a lack of data and measurement tools. Improved data collection will therefore be key to monitoring financial inclusion going forward, including data on DFS offered both by banks and non-banks. Greater transparency would benefit investors and customers, and foster a more competitive DFS market.

- **Leading through example.** Increasing the volume of government payments which are made using DFS could encourage broader acceptance of this medium, as opposed to cash.
- **Address regulatory gaps,** such as regulations on consumer protection. Addressing regulatory gaps on microfinance institutions can facilitate more partnerships with DFS and enhance the role of DFS in financial inclusion.
- **Complete the National Switch project and upgrade supervision of payments systems.** The new NPSA, guidelines for mobile money, remittances regulations and agent banking guidelines are a few of the areas where the authorities are working to improve the legal and regulatory environment for digital financial services. The NPSA will give the BSL the power to regulate and oversee the National Payment System as a whole. To complement the reforms on the legal side, the BSL will also need to upgrade its supervision of payments systems, including developing an effective oversight framework, an important priority supported currently by Fund CD.
- **Improve staffing and capacity at the regulator.** The recent FSSR found that the Other Financial Institutions Supervision Department (OFSID) at the BSL, which is responsible for supervising MNOs among others, is severely under-resourced and that staff need capacity building in DFS. In addition, the UNCDF (2021) noted that results from a survey of financial service providers timelines for approval of DFS may be lengthy and non-transparent. Beyond OFSID, staff in other departments, such as the Financial Stability, Monetary Policy, and Research Departments, will need to be aware of the potential impact of DFS on their areas of operation.
- **Digitalize important credit-related services such as the Credit Reference Bureau.** This should remove one of the obstacles to obtaining access to credit in Sierra Leone.

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